CALIFORNIA DEPARTMENT OF HEALTH SERVICES
850 Marina Bay Parkway, Richmond, CA 94804

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring Program

Monthly Marine Biotoxin Report

June 2007

Technical Report No. 07-20

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of June, 2007. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at a several sampling stations between San Luis Obispo and Santa Barbara counties, as well as in

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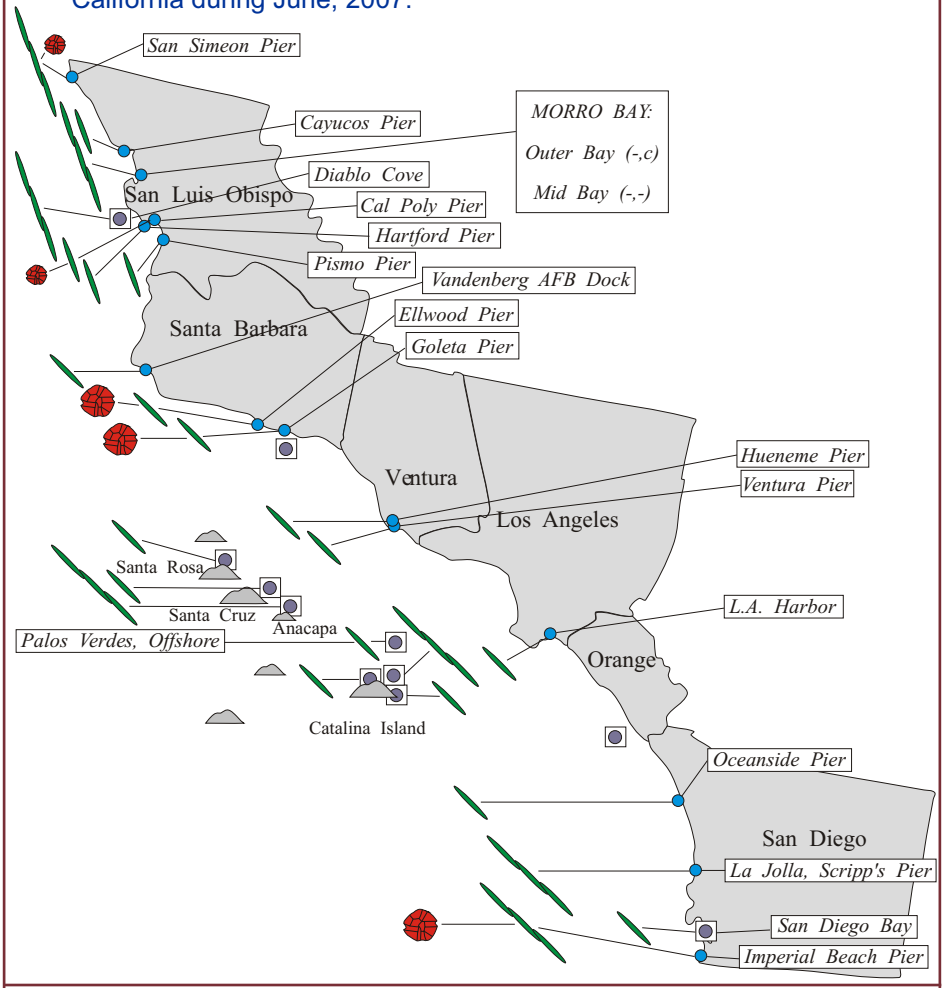
Figure 1. Distribution of toxin-producing phytoplankton in Southern California during June, 2007.



Relative Abundance of Known Toxin Producers

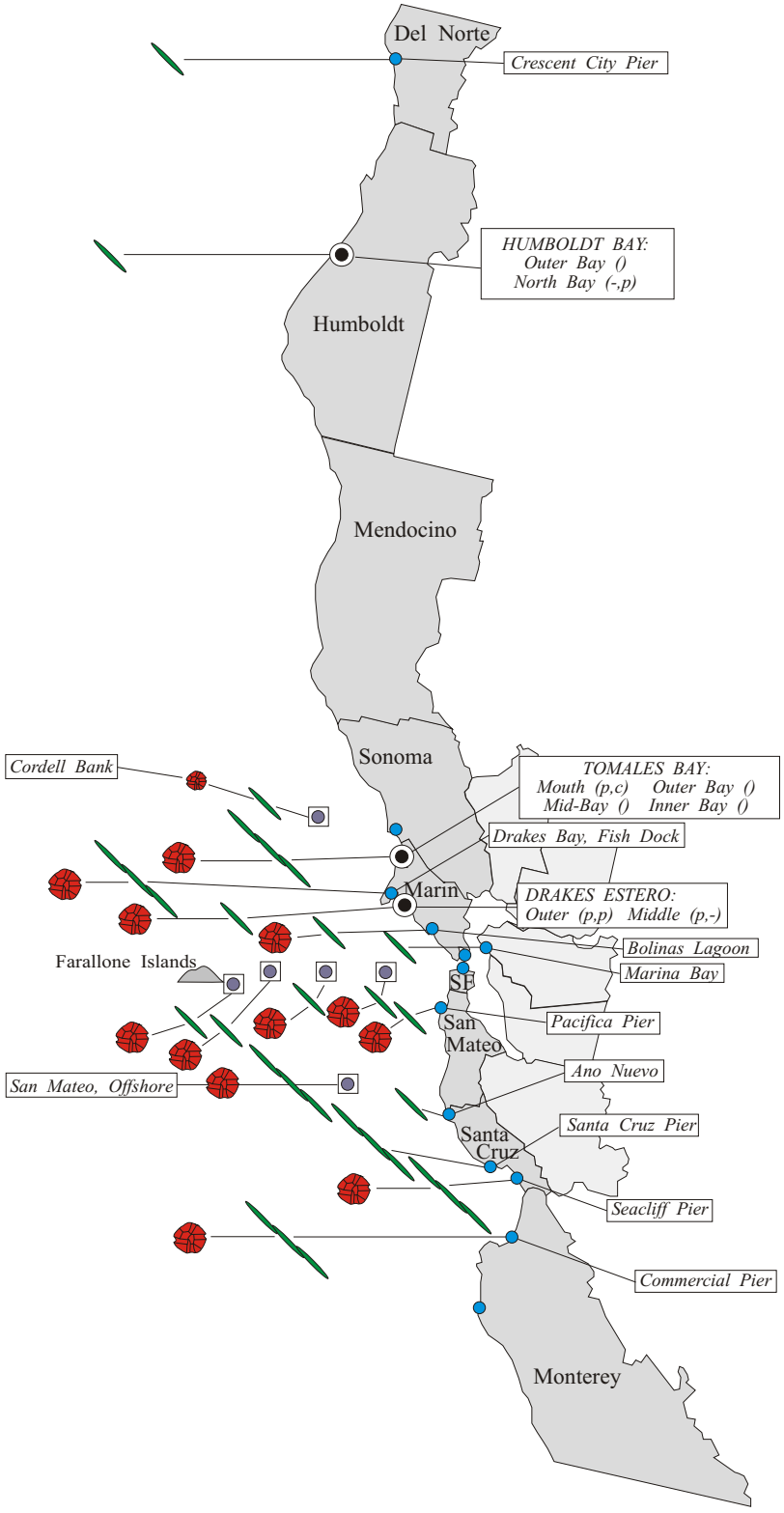
Alexandrium Species	Pseudo-nitzschia Species
Rare (less than 1%)	Present (less than 10%)
Present (between 1% and 10%)	Common (between 10% and 50%)
Common (between 10% and 50%)	Abundant (greater than 50%)
Abundant (greater than 50%)	

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during June, 2007.



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southern San Diego County, during June (Figure 1). The distribution and relative abundance of this dinoflagellate decreased compared to the previous month. *Alexandrium* was no longer observed at offshore sites as in previous months.

A low concentration of the PSP toxins was detected in sentinel mussels from Avila (San Luis Obispo County) during the first week of the month (Figure 3). These toxins were not detected at any other sampling locations during June.

Domoic Acid

Pseudo-nitzschia numbers declined in most areas of the Southern California coast (Figure 1). In contrast, this diatom was observed at sites along the San Diego coast for the first time since April. The highest relative abundances of *Pseudo-nitzschia* were observed offshore of Diablo Cove (June 20) and at the Imperial Beach Pier (June 26).

Domoic acid was not detected in any shellfish samples collected in June. A low concentration of this toxin was detected in a sample of lobster viscera from Anacapa Island on June 28 (Figure 3).

Non-toxic Species

A mixture of diatoms and dinoflagellates were observed along the Southern California coast

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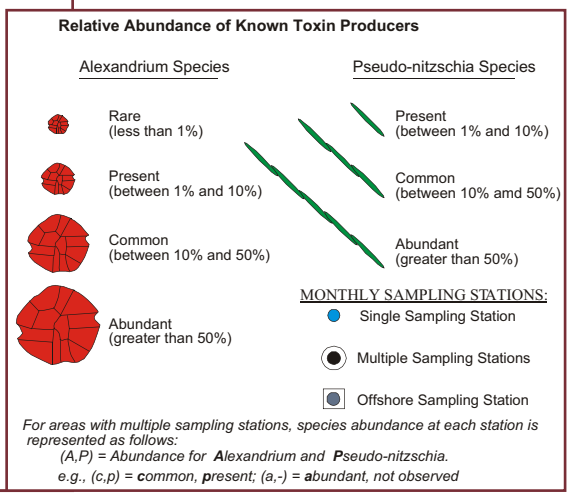
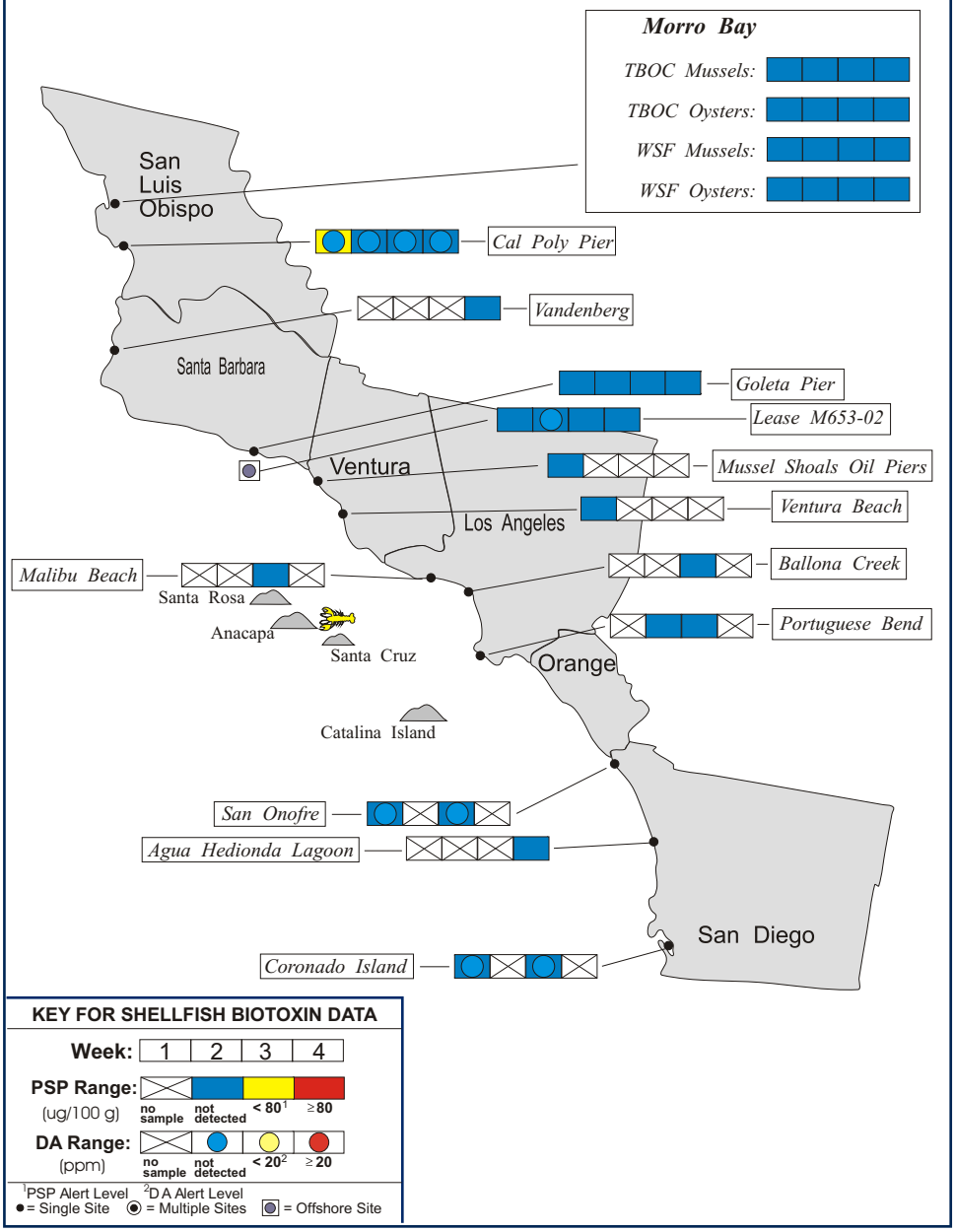


Figure 3. Distribution of shellfish biotoxins in Southern California during June, 2007.



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in June. Common diatoms included *Chaetoceros*, *Thalassiosira*, and *Skeletonema*. The dinoflagellates most commonly observed included several species of the genus *Ceratium*, which was ubiquitous along the Southern California coast, and *Prorocentrum*, which was common at some sites in Ventura and San Diego counties.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at sites between Marin and Monterey counties in June (Figure 2). This represented a slight increase in distribution compared to the previous month as a result of observations of this dinoflagellate in outer Tomales Bay and offshore of Pt. Reyes. *Alexandrium* continued to be observed in significant numbers as far offshore as the Farallone Islands. The relative abundance of this dinoflagellate increased at several sites, with the highest relative abundance observed in a sample collected just inside Tomales Bay (June 30).

PSP toxins were detected in sentinel mussels from the Santa Cruz Pier during the second week of June through the end of the month (Figure 4). By the third week of

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The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Health Services, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553 - 4133

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June these toxins were detected in shellfish samples from San Francisco and Marin counties, with elevated levels in Drakes Bay (166 ug/100 g) and Drakes Estero (91 ug). PSP toxin concentrations reached 619 ug in Drakes Estero on June 21, then began a general pattern of decline with periodic, short-lived increases. Toxins remained above the alert level in sentinel shellfish from the mid-Estero but declined to safe levels in the outer sentinel buoy by the end of the month.

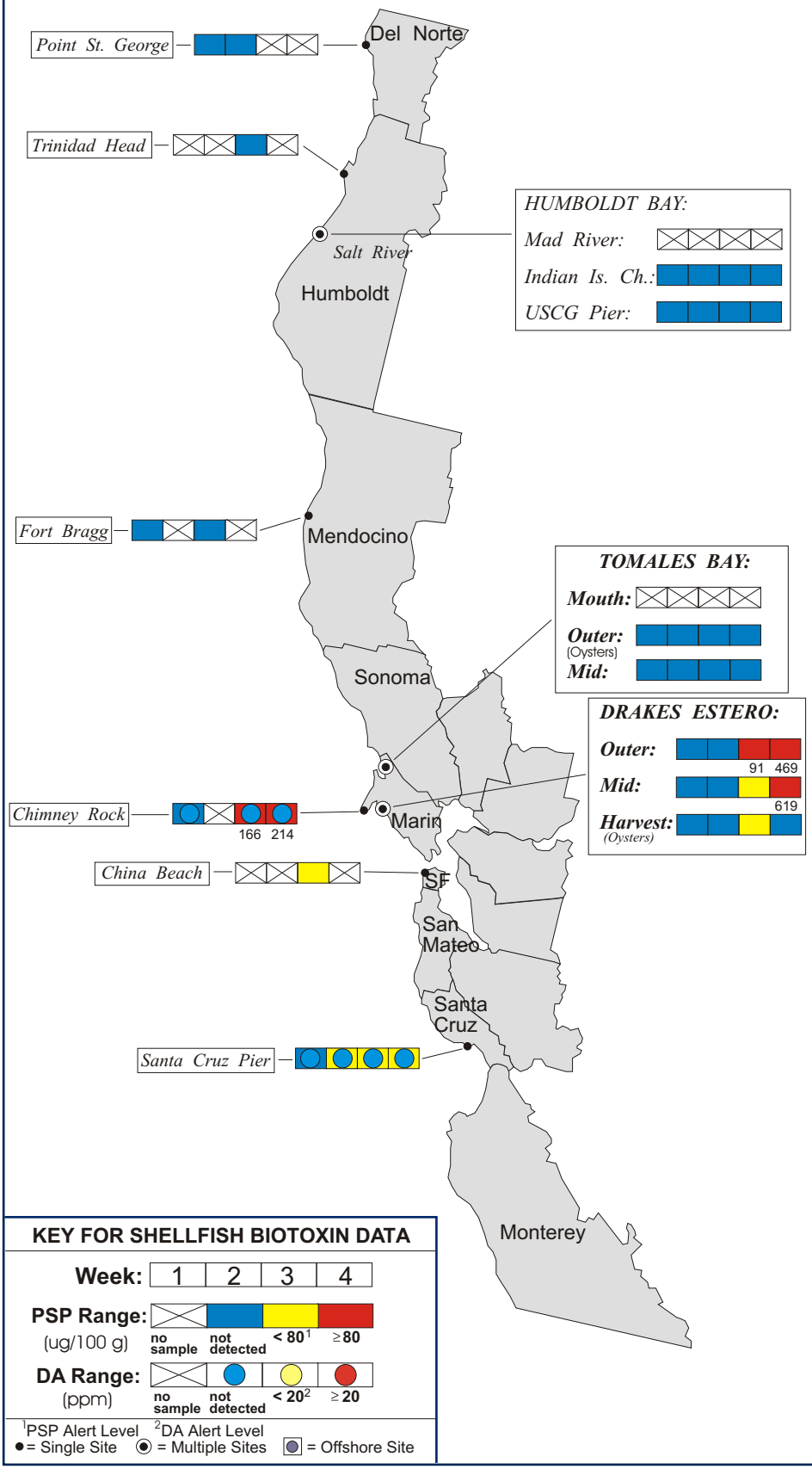
Domoic Acid

The distribution of *Pseudo-nitzschia* was similar to observations in May, however the relative abundance decreased at most locations (Figure 2). Domoic acid was not detected in any shellfish samples collected in June.

Non-toxic Species

Diatoms continued to dominate the phytoplankton assemblage along the Northern California coast. *Chaetoceros* was by far the most common diatom. *Skeletonema* and *Thalassiosira* continued to be common at many locations.

Figure 4. Distribution of shellfish biotoxins in Northern California during June, 2007.



QUARANTINES:

The annual mussel quarantine was initiated early, on April 20, due to the widespread increase in domoic acid levels along the coast. The annual quarantine, which normally goes into effect on May 1 of each year, applies specifically to sport-harvested mussels and is in effect for the entire California coastline, including all bays and estuaries. Routine phytoplankton and

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Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during June, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	8
	Humboldt County Environmental Health Department	1
Mendocino	Mendocino County Environmental Health Department	2
Sonoma	None Submitted	
Marin	Bernal Brothers Oyster Company	1
	Cove Mussel Company	5
	Drakes Bay Oyster Company	33
	Hog Island Oyster Company	5
	CDHS Marine Biotoxin Monitoring Program	6
	Marin Oyster Company	1
San Francisco	San Francisco County Health Department	1
San Mateo	None Submitted	
Santa Cruz	U.C. Santa Cruz	4
Monterey	None Submitted	1
San Luis Obispo	Cal Poly	5
	Tomales Bay Oyster Company	8
	Williams Shellfish Farms	8
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	4
	Vandenberg AFB	1
Ventura	Ventura County Environmental Health Department	2
Los Angeles	Los Angeles County Health Department	4
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	1
	CDHS Volunteer (Steve Crooke)	4

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biotoxin monitoring is maintained throughout the quarantine period. The annual quarantine does not affect the certified commercial shellfish growing areas in California. All certified shellfish growers are required to submit at least weekly samples of shellfish for toxin monitoring. Harvest restrictions or closures are implemented as needed to protect the public's health.

On April 27 the State Public Health Officer warned the public to avoid eating sport-harvested species of bivalve shellfish, sardines and anchovies, or the organs or viscera of sport-harvested or commercially sold lobster or crab taken from the coast between San Luis Obispo and Orange counties. This advisory was the result of the Department's monitoring efforts, which detected elevated levels of domoic acid in a variety of seafood species.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat.

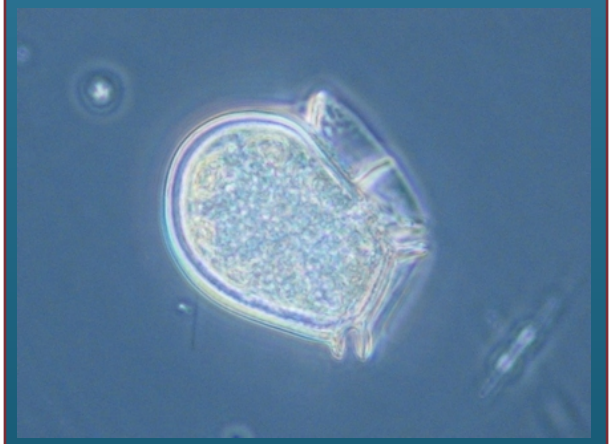
Consumers are also advised that cooking does not eliminate the toxins from the shellfish tissue. Sportharvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.

Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during June, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	4
Mendocino	None Submitted	
Sonoma	Cordell Banks National Marine Sanctuary	1
	CDHS Volunteer (*Cathleen Cannon*)	1
Marin	Audubon California	3
	CDHS Volunteers (*Brent Anderson, Cal Strobel,*	11
	Marjorie Siegel, Mary Von Tolksdorf, Richard	
	Drakes Bay Oyster Company	9
	CDHS Marine Biotoxin Monitoring Program	3
Contra Costa	CDHS Marine Biotoxin Monitoring Program	2
San Francisco	CDHS Volunteer (*Eugenia McNaughton*)	2
	Gulf of the Farallones National Marine Sanctuary	22
San Mateo	San Mateo County Environmental Health	1
	The Marine Mammal Center (*Stan Jensen*)	4
	U.C. Santa Cruz	4
	Gulf of the Farallones National Marine Sanctuary	4
Santa Cruz	The Marine Mammal Center (*Nancy*	2
	U.C. Santa Cruz	4
	California Department of Parks and Recreation	1
Monterey	Monterey Abalone Company	4
	Marine Pollution Studies Laboratory	4
San Luis Obispo	CDHS Volunteer (*Renee and Auburn Atkins*)	2
	Cal Poly	11
	Monterey Bay National Marine Sanctuary	5
	Morro Bay National Estuary Program	4
	Tenera Environmental	2
	The Marine Mammal Center (*Debbie Davis*)	1
Santa Barbara	CDHS Volunteer (*Sylvia Short*)	4
	Channel Islands National Marine Sanctuary	1
	National Park Service	1
	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	4
	Vandenberg AFB	2
Ventura	CDHS Volunteers (*Fred Burgess, Dennis*	5
	Ventura County Environmental Health	1
Los Angeles	Los Angeles County Sanitation District	4
	Southern California Marine Institute	2
	Guided Discoveries, Tole Mour	3
Orange	Ocean Institute	2
San Diego	Avian Research Associates	2
	CDHS Volunteers (*Paul Sims, Jeff Kermode*)	4
	Scripps Institute of Oceanography	4

PHYTOPLANKTON GALLERY

Pseudo-nitzschia declined in numbers but remained common at many sampling locations.



The dinoflagellate Dinophysis was observed in low numbers at several locations.

The diatom Odontella (formerly Biddulphia) was present in a sample from Crescent City.